

**ABSTRACT****Electromagnetic simulation algorithm, in particular for  
the performance of an antenna**

The present invention pertains to an electromagnetic simulation algorithm, which makes it possible to compute the electromagnetic wave scattered by a conductor in a monofrequency situation.

To this end, the invention relates to an electromagnetic simulation algorithm based an iterative solution of a system of integral equations comprising a preconditioner. This preconditioner arises in particular from adapting Calderon's formulae to the boundary integral equations of electromagnetism, also known as the Electric Field Integral Equation (EFIE). Use is also made of an original representation of the residual of the computations during each iteration. This representation, as well as a projection and a composition, are involved in the expression of said preconditioner.

It applies in particular to the simulation tools used during the design of reception or transmission antennas such as cellphone antennas, anti-collision radar antennas, those of electronic counter measures (ECM) systems, of monitoring or tracking radars, or satellite antennas. The invention also applies to the computation of radar cross sections (RCS) of objects whose geometrical properties are known.

**Figure 1**